

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.-2. (canceled)

3. (currently amended) An electronic control unit comprising a first computer and a second computer, characterized in that:

the first computer includes a first diagnostic means for diagnosing operation of the first computer by performing a first diagnosis and a second diagnosis, in which a first value and a second value are calculated using at least two kinds of operations, a first comparison is performed between the first value and a pre-stored first reference value for determining whether a relationship between the first value and the first reference value is normal, and a second comparison is performed between the second value and a pre-stored second reference value for determining whether a relationship between the second value and the second reference value is normal;

the first computer further includes a data transmitting means for sending a first set of diagnostic data regarding the first diagnosis and a second set of diagnostic data regarding the second diagnosis, respectively;

the second computer includes a data receiving means for receiving the first set and the second set of diagnostic data; and

YAMADA

Application No. 10/761,377

November 1, 2005

the second computer further includes a second diagnostic means for determining whether the first diagnostic means normally operates based on the first and the second diagnostic data;

the data transmitting means sends the first set of diagnostic data including the first calculated value and the first reference value as the first diagnostic data, and the second set of diagnostic data including the second calculated value and the second reference value as the second diagnostic data;

the second diagnostic means performs a third diagnosis for determining whether a result of the first comparison is normal, and a fourth diagnosis for determining whether a result of the second comparison is normal;

~~The electronic control unit according to claim 2, wherein:~~

the first diagnostic means regularly performs the first comparison and the second comparison;

the data transmitting means sends any one of the first set of diagnostic data and the second set of diagnostic data whichever most recently generated; and

the second diagnostic means determines that the first diagnosis is halted when a period during which the receiving means has not received the first set of diagnostic data exceeds a predetermined reference period, and that the second diagnosis is halted when a period during which the receiving means has not received the second set of diagnostic data exceeds the predetermined reference period.

YAMADA

Application No. 10/761,377

November 1, 2005

4. (original) The electronic control unit according to claim 3,
wherein the data transmitting means alternately sends the first set of diagnostic
data and the second set of diagnostic data.

5. (original) The electronic control unit according to claim 3,
wherein the second computer further including a fault recovery means that
performs different fault recovery procedures for different conditions, including
conditions in which the second diagnostic means has determined that the diagnosis
is halted and in which the second diagnostic means has determined that the
comparison performed by the first diagnostic means is faulty.

6. (canceled)

7. (currently amended) An electronic control unit comprising a
first computer and a second computer, characterized in that:

the first computer includes a first diagnostic means for diagnosing
operation of the first computer by performing a diagnosis, in which a comparison
is performed between a value calculated using a predetermined operation and a
pre-stored reference value for determining whether a relationship between the
calculated value and the pre-stored reference value is normal;

the first computer further includes a data transmitting means for sending the

YAMADA

Application No. 10/761,377

November 1, 2005

calculated value and the pre-stored reference value used for the diagnosis

performed by the first diagnostic means;

the second computer includes a receiving means for receiving the

calculated value and the pre-stored reference value;

the second computer further includes a second diagnostic means for

determining whether the first diagnostic means normally operates based on a

comparison between the calculated value and the pre-stored reference value

received by the receiving means;

~~The electronic control unit according to claim 6, wherein:~~

the first diagnostic means regularly performs the diagnosis;

the data transmitting means sends the calculated value and the pre-stored
reference value used in the diagnosis most recently performed; and

the second diagnostic means determines that the diagnosis of the first
diagnostic means is at halt when a period during which the receiving means has
not received the calculated value and the pre-stored reference value exceeds a
predetermined reference period.

8. (original) The electronic control unit according to claim 7,

wherein the second computer further including a fault recovery means that

performs different fault recovery procedures for different conditions, including

conditions in which the second diagnostic means has determined that the diagnosis

YAMADA

Application No. 10/761,377

November 1, 2005

is halted and in which the second diagnostic means has determined that the comparison performed by the first diagnostic means is faulty.

9. (original) The electronic control unit according to claim 8, wherein:

the first computer and the second computer are used for controlling the throttle angle of a throttle valve of a vehicular engine; and
the fault recovery means maintains the throttle angle control with a predetermined upper limit when the second diagnostic means has determined that the diagnosis is halted by the first diagnostic means, and stops the throttle angle control when the second diagnostic means has determined that the diagnosis performed by the first diagnostic means is faulty.

10. (currently amended) An electronic control unit comprising a first computer and a second computer, characterized in that:

the first computer includes a first diagnostic means for diagnosing operation of the first computer by performing a first diagnosis and a second diagnosis, in which a first value and a second value are calculated using at least two kinds of operations, a first comparison is performed between the first value and a pre-stored first reference value for determining whether a relationship between the first value and the first reference value is normal, and a second

YAMADA

Application No. 10/761,377

November 1, 2005

comparison is performed between the second value and a pre-stored second reference value for determining whether a relationship between the second value and the second reference value is normal;

the first computer further includes a data transmitting means for sending a first set of diagnostic data regarding the first diagnosis and a second set of diagnostic data regarding the second diagnosis, respectively;

the second computer includes a data receiving means for receiving the first set and the second set of diagnostic data;

the second computer further includes a second diagnostic means for determining whether the first diagnostic means normally operates based on the first and the second diagnostic data; and

~~The electronic control unit according to claim 1, wherein the first computer and the second computer are both provided in a vehicle.~~

11.-13. (canceled)

14. (currently amended) An electronic control unit comprising a first apparatus and a second apparatus, wherein:

the first apparatus includes:

YAMADA

Application No. 10/761,377

November 1, 2005

a first diagnostic portion that performs a diagnosis operation for
determining whether the first apparatus is normal based on at least one
value calculated in the first apparatus; and
a transmitting portion that transmits information with respect to the
diagnosis operation of the first diagnostic portion;
the second apparatus includes a second diagnostic portion that determines
whether the first diagnostic portion is normal based on the information transmitted
from the transmitting portion of the first apparatus;
the first apparatus is a computer;
the at least one value, which is calculated in the first apparatus, includes
first and second values that are calculated by the first diagnostic portion;
the first diagnostic portion performs a first diagnosis in the diagnosis
operation to determine whether a relationship between the first value and a pre-
stored first reference value is normal;
the first diagnostic portion further performs a second diagnosis in the
diagnosis operation to determined whether a relationship between the second value
and a pre-stored second reference value is normal;
the information, which is transmitted by the transmitting portion of the first
apparatus, includes information with respect to at least one of the first diagnosis
and the second diagnosis; and

YAMADA

Application No. 10/761,377

November 1, 2005

~~The electronic control unit according to claim 13, wherein the second diagnostic portion determines that the first diagnostic portion is abnormal when it is determined that at least one of the first diagnosis and the second diagnosis is not performed beyond a predetermined time period based on the information transmitted from the transmitting portion of the first apparatus.~~

15. (previously presented) The electronic control unit according to claim 10, wherein the transmitting portion of the first apparatus periodically transmits the information throughout a normal operation of the first apparatus.

16. (previously presented) The electronic control unit according to claim 10, wherein the first apparatus and the second apparatus are used for controlling an engine.

17. (currently amended) An electronic control unit comprising a first computer and a second computer, characterized in that:
the first computer includes a first diagnostic means for diagnosing
operation of the first computer by performing a first diagnosis and a second
diagnosis, in which a first value and a second value are calculated using at least
two kinds of operations, a first comparison is performed between the first value
and a pre-stored first reference value for determining whether a relationship

YAMADA

Application No. 10/761,377

November 1, 2005

between the first value and the first reference value is normal, and a second comparison is performed between the second value and a pre-stored second reference value for determining whether a relationship between the second value and the second reference value is normal;

the first computer further includes a data transmitting means for sending a first set of diagnostic data regarding the first diagnosis and a second set of diagnostic data regarding the second diagnosis, respectively;

the second computer includes a data receiving means for receiving the first set and the second set of diagnostic data;

the second computer further includes a second diagnostic means for determining whether the first diagnostic means normally operates based on the first and the second diagnostic data; and

~~The electronic control unit according to claim 1, wherein the first computer and the second computer are located locally with respect to each other.~~

18. (currently amended) An electronic control unit comprising a first computer and a second computer, characterized in that:

the first computer includes a first diagnostic means for diagnosing operation of the first computer by performing a diagnosis, in which a comparison is performed between a value calculated using a predetermined operation and a pre-stored reference value for determining whether a relationship between the

YAMADA

Application No. 10/761,377

November 1, 2005

calculated value and the pre-stored reference value is normal;

the first computer further includes a data transmitting means for sending the calculated value and the pre-stored reference value used for the diagnosis performed by the first diagnostic means;

the second computer includes a receiving means for receiving the calculated value and the pre-stored reference value;

the second computer further includes a second diagnostic means for determining whether the first diagnostic means normally operates based on a comparison between the calculated value and the pre-stored reference value received by the receiving means; and

~~The electronic control unit according to claim 6, wherein the first computer and the second computer are located locally with respect to each other.~~

19. (currently amended) An electronic control unit comprising a first apparatus and a second apparatus, wherein:

the first apparatus includes:

a first diagnostic portion that performs a diagnosis operation for determining whether the first apparatus is normal based on at least one value calculated in the first apparatus; and

a transmitting portion that transmits information with respect to the diagnosis operation of the first diagnostic portion;

YAMADA

Application No. 10/761,377

November 1, 2005

the second apparatus includes a second diagnostic portion that determines whether the first diagnostic portion is normal based on the information transmitted from the transmitting portion of the first apparatus; and

The electronic control unit according to claim 11, wherein the first apparatus and the second apparatus are located locally with respect to each other.

20. (currently amended) An electronic control unit comprising a first computer and a second computer, characterized in that:

the first computer includes a first diagnostic means for diagnosing operation of the first computer by performing a diagnosis, in which a comparison is performed between a value calculated using a predetermined operation and a pre-stored reference value for determining whether a relationship between the calculated value and the pre-stored reference value is normal;

the first computer further includes a data transmitting means for sending the calculated value and the pre-stored reference value used for the diagnosis performed by the first diagnostic means;

the second computer includes a receiving means for receiving the calculated value and the pre-stored reference value;

the second computer further includes a second diagnostic means for determining whether the first diagnostic means normally operates based on a comparison between the calculated value and the pre-stored reference value

YAMADA

Application No. 10/761,377

November 1, 2005

received by the receiving means; and

~~The electronic control unit according to claim 6, wherein the first computer and the second computer are both provided in a vehicle.~~

21. (currently amended) An electronic control unit comprising a first apparatus and a second apparatus, wherein:

the first apparatus includes:

a first diagnostic portion that performs a diagnosis operation for determining whether the first apparatus is normal based on at least one value calculated in the first apparatus; and

a transmitting portion that transmits information with respect to the diagnosis operation of the first diagnostic portion;

the second apparatus includes a second diagnostic portion that determines whether the first diagnostic portion is normal based on the information transmitted from the transmitting portion of the first apparatus; and

~~The electronic control unit according to claim 11, wherein the first apparatus and the second apparatus are both provided in a vehicle.~~

22.-24. (canceled)

25. (currently amended) A method of operating a first computer

YAMADA
Application No. 10/761,377
November 1, 2005

and a second computer, the method comprising:

in the first computer, performing a diagnosing operation of the first computer by performing a diagnosis, in which a comparison is performed between a value calculated using a predetermined operation and a pre-stored reference value for determining whether a relationship between the calculated value and the pre-stored reference value is normal;

transmitting, from the first computer, the calculated value and the pre-stored reference value used for the diagnosis performed by the first computer;

receiving, in the second computer, the calculated value and the pre-stored reference value; and

determining, in the second computer, whether the diagnosing operation of the first computer is performed normally based on a comparison between the calculated value and the pre-stored reference value received by the second computer;

The method according to claim 24,
wherein[:]] the first computer regularly performs the diagnosis;
the first computer transmits the calculated value and the pre-stored reference value used in the diagnosis most recently performed; and
the second computer determines that the diagnosis of the first computer is at halt when a period during which the second computer has not received the calculated value and the pre-stored reference value exceeds a predetermined

YAMADA
Application No. 10/761,377
November 1, 2005

reference period.